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Inspection of Commercial Fertilizers—1984

By Lester Hankin

THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION
New Haven Bulletin 824 February 1985



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INSPECTION OF COMMERCIAL FERTILIZERS--1984

by Lester Hankin

During 1984, 258 samples of fertilizer and fertilizer ingredients were examined. Of this number and included in this Bulletin are 235 official samples collected by inspectors in the Connecticut Department of Agriculture for authenticity of label guarantee and compliance with State Regulations. The remainder of the samples tested were for farmers, Station departments, those questioned for authenticity, and miscellaneous materials. Although all label guarantees are examined, only the results for the major plant nutrients of nitrogen, phosphoric acid, and potash are presented here.

Table 1 shows individual samples from 44 manufacturers. The number designating each sample, as for example 10-10-10, indicates the guaranteed percentage for nitrogen (N), phosphoric acid (P₂O₅), and potash (K₂O), in that order. A brand name, if available, follows. The actual content found is then shown, with deficiencies identified by an asterisk (*). Table 2 summarizes for each manufacturer the number of guarantees examined for each plant nutrient, the percentage of the samples not meeting their guarantee, and the average percentage of guarantee found. Table 3 shows distribution of mixed fertilizer sold in Connecticut. Only formulations prepared by at least three manufacturers are shown; other formulations are placed in the miscellaneous category. The tonnage of fertilizer material and mixed fertilizer sold in Connecticut is shown in Table 4.

Two types of variability affect fertilizer analysis and must be considered in judging deficiencies. The first is the variability among different batches of the same formulation from a manufacturer. This variability can be noted in Table 1 by examining the analyses of the same formulation from the same manufacturer. The second type of variability is between duplicate analyses of the same sample. The variability among duplicate analyses is shown in the statement: the mean difference between duplicates for nitrogen is four-tenths percent, for phosphoric acid it is one-fourth percent, and for potash one-fifth percent.

Fertilizer samples are deemed deficient in any nutrient if the analysis is below the guarantee by more than the values established by the Association of American Feed Control Officials. Overall, 227 guarantees for nitrogen were made and 17% were deficient, 223 guarantees for phosphoric acid and 15% were deficient, and 224 guarantees for potash and 5% were deficient.

Analyses were performed by H. Kocaba, M. Pyles, M.A. Illig, and E. Hickson. Samples were collected by J. Dippel, D. Nisely, and A. VanDyke under the direction of K. Veit. Fertilizer laws are administered by the Commissioner of Agriculture.

Lester Hankin
Chief, Analytical Chemistry

Table 1. Analysis of Individual Samples of Commercial Fertilizers.

<u>Manufacturer, guarantee, & brand</u>	<u>Nutrients found</u>	<u>% Nitrogen</u>	<u>% P2O5</u>	<u>% K2O</u>	<u>Nutrients found</u>	<u>% Nitrogen</u>	<u>% P2O5</u>	<u>% K2O</u>
<u>ADCO Works</u>								
No guar.	ADCO Organic Plant Food	7.7	3.6	0.9	25-03-06 26-04-08 28-04-12 28-04-12	Hart's Prem. Crabbr. Prev/Ln Food Stanford's Old English Lawn Food Hart's Premium Lawn Hart's Premium Lawn Fert.	30.6 27.3 33.0 27.8	4.7 4.1 3.4 4.1
<u>Agrico</u>								
05-10-05	Agrico Village Green	*2.9	11.6	5.2	Atlas Fish Fertilizer Co.			
05-10-10	Agrico Village Green	*2.8	*6.0	9.5	05-01-01	Atlas Org Fish Emulsion Plant Food	4.7	2.0
10-06-04	Agrico Village Green	*7.1	5.5	4.8				
10-08-10	Agrico Village Green	*8.8	*7.0	13.7				
10-10-10	Agrico Village Green	9.9	9.9	11.3				
10-20-10	Agrico	9.4	21.7	9.3	HPC Chemical			
15-08-12	Agrico	*12.4	7.8	14.1				
46-00-00	Agrico Urea	47.4			38-00-00	Blue Chip Nitroform Slow Rel. N	39.2	
46-00-00	Agrico Urea	46.9						
<u>Burpee</u>								
					18-04-07	Burpee Grow Azalea, Cam. & Rhod.	18.2	4.1
					18-12-14	Burpee Grow Flowers	19.5	7.1
00-10-43	Agway Blend	*7.6	44.4		18-24-06	Burpee Grow Transplants	19.4	13.0
00-10-43	Agway Blend	10.7	44.9		18-24-06	Burpee Grow Vegetables	18.2	23.8
Bulk		10.4	42.9		20-04-08	Burpee Grow Shrubs, Trees, Evergreens	20.8	7.3
05-10-05	Agway Garden Plant Food	4.6	9.7	6.4				
05-10-10	Agway Plant Food	5.0	10.1	9.5				
08-04-04	Agway Evergreen Plant Food	9.5	5.0	4.4				
08-16-16	Agway Super Garden	8.6	16.2	16.1				
08-16-16	Agway Super Garden	8.5	*14.5	18.0				
08-16-16	Agway Super Garden	11.0	12.5	10.8	05-10-05	Surge	6.2	10.2
10-10-10	Agway	*8.3	10.3	9.5	05-10-05	Surge Lawn & Garden Fert.	4.5	*8.1
10-10-10	Agway Blend Rite	*21.0	23.8		05-10-05	Surge Lawn & Garden Fert.	6.8	4.5
11-24-24	Bulk	15.8	31.0		05-10-10	C & J Specialty Fert.	*3.2	*3.7
12-24-24	Agway Blend	*10.9	24.0		05-10-10	C & J Specialty Fert.	*5.6	12.2
16-32-16	Agway Start & Gro	17.1	33.6	17.9	05-10-10	C & J Specialty Fert.	*6.8	12.6
20-09-24	Agway Blend	21.0	*6.0	36.0	05-10-10	Surge Plant Food, Veg & Flower	5.5	9.2
20-10-20	Agway Blend	26.9	9.3	*16.8	10-06-04	C & J Hi-Organic Fert.	*7.8	9.1
20-10-20	Agway Blend	22.9	10.4	20.5	10-06-04	Surge	*8.8	10.3
20-13-20	Bulk	26.0	14.5	20.8	10-06-04	Surge Lawn & Garden	*7.4	4.2
20-20-20	Agway Sol-U-Green	19.5	21.6	24.2	10-08-10	C & J Fert.	10.7	5.8
22-16-16	Agway	26.9	17.9	16.7	10-10-10	C & J Specialty Fert.	*7.7	6.4
23-08-21	Bulk	28.1	8.9	23.4	10-10-10	C & J Specialty Fert.	10.3	9.1
23-11-19	Agway	34.1	9.6	*14.1	10-10-10	C & J Specialty Fert.	11.8	13.7
23-12-18	Agway Blend	25.4	*9.3	22.2	10-10-10	C & J Specialty Fert.	11.3	8.3
23-12-18	Bulk	23.3	16.7	17.6	13.75-00-44.5	C & J Specialty Fert. Pot. Nit.	*11.4	59.8
27-02-20	Agway Blend	23.8	4.1	27.5	15-15-15	C & J Specialty Fert.	18.1	14.0
35-03-10	Agway Blend	*28.8	3.9	22.9	18-46-00	C & J Spec. Fert. Diamm. Phosph.	19.2	46.8
<u>All Jack Co.</u>					20-10-10	Super Surge	20.4	11.4
15-30-15	K-Cro All Purpose Plant Food	16.8	33.4	19.9	20-10-10	Super Surge Lawn Food	19.6	10.4
						Chevron Chemical Co.	10.5	9.7
					05-10-05	Ortho House Plant Food	5.5	6.5

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Manufacturer, guarantee, & brand		Nutrients found			Manufacturer, guarantee, & brand		
		% Nitrogen	% P2O5	% K2O	% Nitrogen	% P2O5	% K2O
05-10-05	Ortho House Plant Food (liq)	5.7	10.7	5.6	Estech General Chemical Co.		
05-10-10	Ortho Vegetable, Cam. & Rbd. Food	6.1	10.5	9.6			
05-10-10	Ortho Vegetable Garden Food	6.7	10.5	*8.0	05-10-05	Gro-Tone P.Food All Purp./50% org	6.6
05-15-05	Ortho UP START Root Stimulator	5.2	15.1	5.2	05-10-05	K-Mart Lawn & Garden Food	9.7
06-09-05	Ortho African Violet Food	6.6	10.7	5.2	05-10-05	Perk-up Plant Food	11.8
06-09-05	Ortho Liquid African Violet Food	6.3	9.1	6.0	05-10-05	Swift Lawn & Garden	5.5
06-18-06	Ortho Tomato & Vegetable Food	5.6	*10.9	5.4	05-10-05	Red Steer	11.1
08-08-08	Ortho Gen. Purpose Plant Food	8.4	7.3	8.5	05-10-10	Suburban	12.5
10-08-07	Ortho Evergreen & Azalea Food	12.2	8.3	8.1	05-10-10	GroTone Evergreen Food 30% Org. N	6.5
10-08-07	Ortho Fern & Ivy Food	9.8	7.9	7.1	06-18-06	Gro-Tone Rose Food	8.5
10-08-07	Ortho Fern & Ivy Food	11.4	8.1	8.1	07-10-05	Blue Seal Turf Green	11.2
12-06-06	Ortho-Gro Liquid Plant Food	12.6	6.1	6.6	10-03-06	K-Mart Lawn & Garden Food	12.5
<u>Chilean Nitrate Corp.</u>					10-06-04	K-Mart Weed & Feed	7.3
15-00-14	Champion Nitrate of Soda	*12.1			10-06-04	K-Mart Weed & Feed	5.9
16-00-00	Champion Nitrate of Soda	*13.3			10-06-04	Perk-up	4.7
<u>Ciba-Geigy</u>					10-10-10	Red Steer	10.4
20-20-20	Spectrum Earth Care Pro.Plt Food	19.2	20.4	19.5	10-20-10	Corn Starter w/micronutrients	10.1
<u>Clare Laboratories</u>					15-15-15	Red Steer	24.4
00-06-05	Granny's Bloomers African Violets	6.9		5.1	18-03-08	Vigoro Weed and Feed	18.9
<u>Clinton Nurseries</u>					20-10-05	K-Mart Lawn Food	24.0
04-10-10	New Era Flowering Plant Food	4.9	10.3	11.0	21-03-16	Par-Ex Slow Release Fertilizer	21.9
05-12-09	New Era African Violet Food	5.8	12.3	10.7	22-03-08	Vigoro Lawn Food	28.9
06-12-06	New Era Solid Plant Food	7.2	16.5	8.3	23-05-05	Gro-tone Weed Cont. + Lawn Food	26.7
07-15-08	New Era Plant Food	7.3	15.4	8.7	24-03-10	Par-Ex w/IRDV	24.3
08-08-08	New Era Plant Food	8.4	7.7	8.5	24-04-12	Vigoro Weed Control + Lawn Fert.	24.8
12-06-06	New Era 30 Day Food	14.4	7.7	8.9	27-03-03	K-Mart Super K-Gro Lawn Fert.	33.0
<u>Crop Production Service</u>							7.8
05-10-10	Agrico Crop Production Ser.	10.0	14.2	11.3	<u>Fer-Mel Corporation</u>		
12-15-15	Agrico	*5.3	*13.3	15.6	20-04-08	Fer-Mel Fairway Turf Food	20.5
15-10-10	Agrico	23.3	11.5	10.2	20-05-10	Fer-Mel Fairway Turf	22.3
<u>Espoma</u>					25-05-10	Fer-Mel Prem. Lawn Food	28.6
04-03-02	Espoma Plant-tone	6.8	5.0	2.1	<u>Holland Bulb Products</u>		
04-06-06	Espoma Garden-tone	4.7	7.2	*5.1	09-09-06	Holland Bulb Booster	12.2
04-10-06	Espoma Bulb-tone	6.0	13.9	6.5	09-09-06	Holland Bulb Booster	10.0
09-05-04	Espoma Tree-tone	11.7	5.1	6.4			9.2
<u>Hy-Trous</u>							7.0
05-10-10	Agrico				04-12-04	Hy-Trous African Violet Liq. Fert	4.8
12-15-15	Crop Production Ser.				05-10-05	Hy-Trous Liquid Fert.	*3.5
15-10-10	Agrico				05-10-05	Hy-Trous Liquid Fert.	5.7
<u>Hyponex</u>							
04-03-02	Espoma Flowering Pl. Fd Stks	4.2					
04-06-06	Espoma House Plant Food All Furf	*3.3					
04-10-06	Espoma Afr. Violet Liq. Conc.	*4.2					
09-05-04							

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Manufacturer, guarantee, & brand		Nutrients found		Manufacturer, guarantee, & brand		Nutrients found	
		% Nitrogen	% P205	% K20	% Nitrogen	% P205	% K20
32-10-10	Rap-rid-gro Evergreen & Azalea Food	32.2	10.2	12.6	14-07-07	Unified Plant Food	17.9
<u>Ross Daniels</u>					<u>W. R. Grace Co.</u>		
05-35-10	Ross Plant Food Cart For Iron Def.	5.7	37.7	12.8	05-11-26	Peters Prof. H2O Sol. Hyd/Sol.	7.2
08-16-08	Ross Special Evergreen Stakes	12.4	19.3	11.1	07-40-06	MgAmp Plus K	7.2
08-16-16	Ross Gro-Stakes Ff/Orna/Tx/Shrubs	12.3	17.1	18.8	12-36-14	Peters Prof Sol Pl Fd Afr Violet	12.3
08-16-16	Ross Gro-Stakes Fruit & Ornament.	9.9	17.8	20.5	15-10-30	Peters Prof. H2O Sol. Fert/Mum Sp	*10.3
09-40-15	Ross Cartridges Fruits, Nuts, Tom	11.2	50.3	17.5	15-16-17	Peters Prof. H2O Sol. Fert./Peat	*12.8
10-10-10	Ross Gro-Stakes Evergreen	12.4	14.9	13.7	15-30-15	Peters Soluble Plant Food	15.0
10-20-10	Ross Planter's Punch Starter Fert	10.3	19.2	9.3	18-18-18	Peters Special Soluble Plant Food	*12.6
10-20-20	Ross Evergreen Starter	12.2	26.5	31.5	20-10-20	Peters Pro. H2O Sol. Fert/Peat Sp	19.8
10-25-15	Ross Cart Tree & Shrub Starter	13.4	28.3	17.1	20-20-20	Peters Prof Gen Purp Plant Food	*12.0
16-04-08	Ross Grow Stakes Ev/Azal/Cam/Rhod	16.7	5.2	9.0	20-20-20	Peters Prof Sol Pl Fd Gen Purp	*12.6
16-10-09	Ross Gro-Stakes Trees & Shrubs	17.5	10.5	9.1			
					<u>WGM/Hydro</u>		
10-15-10	Schultz-Instant Liq. Plant Food	10.2	*14.1	10.3	15.5-00-00	Vikingship Calcium Nitrate	17.5
10-15-10	Schultz-Instant Liq. Plant Food	11.5	14.0	11.0	<u>Woolfolk Chemical</u>		
					14-14-14	Security Osmocote Fol&Pot Pl Fd	*7.6
							14.2
<u>Sierra Chemical Co.</u>							
14-04-06	Agriform Container Tablets	17.4	5.1	10.8			
14-14-14	Osmocote Cont. Rel. Gert.	13.6	14.2	14.7			
14-14-14	Osmocote Cont. Rel. Gert.	13.6	14.2	14.7			
<u>Stern's Nurseries</u>							
15-30-15	Stern's Miracle-Gro Conc. Pl. Fd.	15.7	29.5	16.4			
30-10-10	Stern's Miracid Soil Acid/Pl. Fd.	31.4	11.2	9.9			
<u>Sudbury Laboratory</u>							
00-00-44	Sudbury Potash 0-0-44				52.1		
00-44-00	Sudbury Phosphorus 0-44-0						
44-00-00	Sudbury Nitrogen 44-0-0						
					50.3		
<u>Swift Agricultural Chemicals</u>							
10-05-05	Vigoro Liquid Plant Food	10.0	6.6	5.5			
<u>Swiss Farms</u>							
04-12-08	Swiss Farms Plant Food	4.9	13.1	16.2			
<u>Unified Div./Diamond Crystal Salt</u>							
10-20-05	Unified Plant Food	13.0	22.1	6.7			

Table 2. Summary for Each Manufacturer of Number of Claims for Individual Plant Nutrients, Percentage of Claims Not Meeting Guarantee, Average Percentage of Guarantee for Each Nutrient.

Company	No. Samples	Number of Claims			% Not Meeting Claim			Average % of Claim		
		N	P205	K20	N	P205	K20	N	P205	K20
Adco Works	1	0	0	0	-	-	-	-	-	-
Agrico	9	9	7	7	56	29	0	84	94	111
Agway	25	22	25	25	14	16	12	110	109	113
All Jack	1	1	1	1	0	0	0	112	111	133
Anderson	4	4	4	4	0	0	0	111	112	122
Atlas Fish Fertilizer	1	1	1	1	0	0	0	94	200	100
EFC Chemical	1	1	0	0	0	-	-	103	-	-
Burpee	5	5	5	5	0	0	0	104	99	118
Cadwell & Jones	20	20	19	19	40	47	5	98	92	107
Chevron	13	13	13	13	0	8	8	110	103	107
Chilean Nitrate	2	2	0	1	100	-	0	82	-	94
Ciba-Geigy	1	1	1	1	0	0	0	96	102	108
Clarel Laboratories	1	0	1	1	-	0	0	-	115	102
Clinton Nurseries	8	8	8	8	0	0	0	114	116	125
Crop Production Ser.	3	3	3	3	33	33	0	133	115	106
Espoma	4	4	4	4	0	0	25	142	132	115
Estech	23	23	23	23	0	13	4	136	133	129
FerMel	3	3	3	3	0	67	0	109	80	122
Holland Bulb	2	2	2	2	0	0	0	123	118	114
Hy-Trous	3	3	3	3	33	0	0	101	98	104
Hyponex	8	8	8	8	25	0	0	100	118	115
International Spike	9	9	9	9	22	0	0	109	116	123
J.T. Baker	1	1	1	1	0	0	0	149	103	117
Lebanon Chemical	12	12	12	12	0	17	8	111	109	130
Loft's Pedigreed Seed	1	1	1	1	100	0	0	89	107	133
Miller Chem. & Fert.	2	2	2	2	0	0	0	102	102	103
Nitrochem	1	1	0	0	100	-	-	91	-	-
O.M. Scott	8	8	8	8	0	0	0	107	107	126
Old Fox	17	16	16	17	25	50	6	97	95	122
Optiflora	1	1	1	1	0	0	0	98	101	105
Plant Research Labs.	4	4	4	4	25	0	0	110	105	111
Plantabbs	2	2	2	2	50	0	0	99	105	121
Ra-Pid-Gro	2	2	2	2	0	0	0	102	103	114
Ross Daniels	11	11	11	11	0	0	0	124	128	122
Schultz	2	2	2	2	0	50	0	109	94	107
Sierra Chemical	3	3	3	3	0	0	0	111	115	143
Stern's Nurseries	2	2	2	2	0	0	0	105	105	104
Sudbury Labs.	3	1	1	1	0	0	0	114	103	118
Swift Agric. Chem.	1	1	1	1	0	0	0	100	132	110
Swiss Farms	1	1	1	0	0	0	0	123	109	203
Unifeed/Diamond Cryst.	2	2	2	2	0	0	0	129	130	154
W.R. Grace	10	10	10	10	50	10	20	90	106	106
WGM/Hydro	1	1	0	0	0	-	-	113	-	-
Woolfolk Chemical	1	1	1	1	100	0	0	54	101	103

Table 3. Distribution of Mixed Fertilizer Sold in Connecticut July 1, 1983-June 30, 1984

GRADE	TONS
0-15-30	181
0-18-36	103
5-10 -5	1382
5-10-10	1046
6-24-24	18
10 -6 -4	1902
10-10-10	5701
10-16-20	60
10-20-10	381
10-20-20	360
12 -4 -8	31
14-14-14	32
15 -8-12	889
15-10-10	1446
15-15-15	716
18-46 -0	1388
20 -4-10	60
20 -8 -8	74
20-10-10	394
20-10-15	94
20-10-20	18
20-20-20	58
22 -4 -4	10
25 -3 -3	336
25 -5-10	184
26 -3 -3	519
27 -3 -3	197
28 -7-14	74
30 -0 -0	764
30 -4 -4	42
32 -4 -4	21
36 -4 -4	34
46 -0 -0	2235
TOTAL	20750
MISCELLANEOUS	21551
GRAND TOTAL	42301

Table 4. Tonnages of Fertilizer Materials and Mixed Fertilizers Sold in Connecticut July 1, 1983-June 30, 1984

COMMODITY	TONS
CHEMICAL NITROGEN	
Ammonium nitrate	386
Anhydrous ammonia	86
Calcium nitrate	93
Nitrogen solutions	1293
Sodium nitrate	7
Urea	256
Ureaform	512
Other nitrogen materials	25
TOTAL	2658
PHOSPHATES	
Bone meal	127
Phosphate rock	8
Superphosphate 20%	18
Superphosphate 46%	402
Other phosphate materials	545
TOTAL	1100
POTASH	
Muriate of potash	1206
Potassium sulfate	11
TOTAL	1217
NATURAL ORGANICS	
Composted cow manure	1183
Cottonseed meal	92
Dried blood	10
Dried manure	4403
Linseed meal	8
Sewage sludge	389
Gelatin	7
TOTAL	6092
SECONDARY AND MICRONUTRIENTS	
Aluminum	3
Borax	17
Iron	1
Magnesium	59
Sulfur	2
Miscellaneous	186
TOTAL	268
TOTAL-COMMODITIES	11355
TOTAL-COMMERCIAL FERTILIZERS	42301
GRAND TOTAL	53636



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